

Claims:

*Sub B*

1. A substantially pure nucleic acid comprising a nucleotide sequence which is at least 60% identical to the nucleotide sequence of SEQ ID NO:1, 3, or 5.

5 2. The nucleic acid of claim 1 comprising the nucleotide sequence of SEQ ID NO:1, 3 or 5.

10 3. The nucleic acid of claim 1, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid which encodes a Helios polypeptide, or a complement thereof.

15 4. The nucleic acid of claim 1, wherein the nucleic acid encodes a polypeptide that reacts with an antibody specific for a Helios polypeptide.

20 5. A substantially pure nucleic acid which encodes a fragment of a Helios polypeptide of at least 60 amino acids in length.

25 6. A substantially pure polypeptide which is at least 60% homologous to an Helios polypeptide.

7. The Helios polypeptide of claim 6 comprising the amino acid sequence of SEQ ID NO:2, 4, or 6.

8. The pure preparation of claim 6, wherein the Helios polypeptide has the following properties:

(a) it can form a dimer with an Helios, Aiolos, or Ikaros polypeptide;

(b) it is expressed in hematopoietic stem cells;

(c) it has a molecular weight of approximately 64 kDa or 68 KDa;

(d) it has at least one zinc finger domain; and

(e) it is a transcriptional activator of a lymphoid gene.

*Sub A*

9. A fragment of the Helios polypeptide of claim 8 which is at least 50 amino acids in length.

5 10. A vector comprising the nucleic acid of any of claims 1-5.

11. A cell comprising the nucleic acid of any of claims 1-5 and 10.

10 12. A purified preparation of an anti-Helios antibody.

13. A method for manufacture of an Helios peptide comprising culturing the cell of claim 11 in a medium to express the Helios polypeptide.

15 14. A method of making an Helios polypeptide, having at least one biological activity of a naturally occurring Helios polypeptide including altering the sequence, of one or more residues and testing the altered polypeptide for the desired activity.

15 20 15. A method for treating an animal for a disorder comprising administering a therapeutically-effective amount of an Helios polypeptide, a cell selected for the expression of a product of the Helios gene, or a nucleic acid encoding an Helios peptide to the animal.

25 16. A method for determining if a subject is at risk for a disorder related to mis-expression of the Helios gene comprising examining the subject for the expression or structure of the Helios gene, non-wildtype structure or expression being indicative of risk.

17. A transgenic animal having an Helios transgene.

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Add  $\alpha^4$

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Sub G3  
Sub G4